

• COLORADO RIVER •  
**AQUEDUCT NEWS**

THE METROPOLITAN WATER DISTRICT

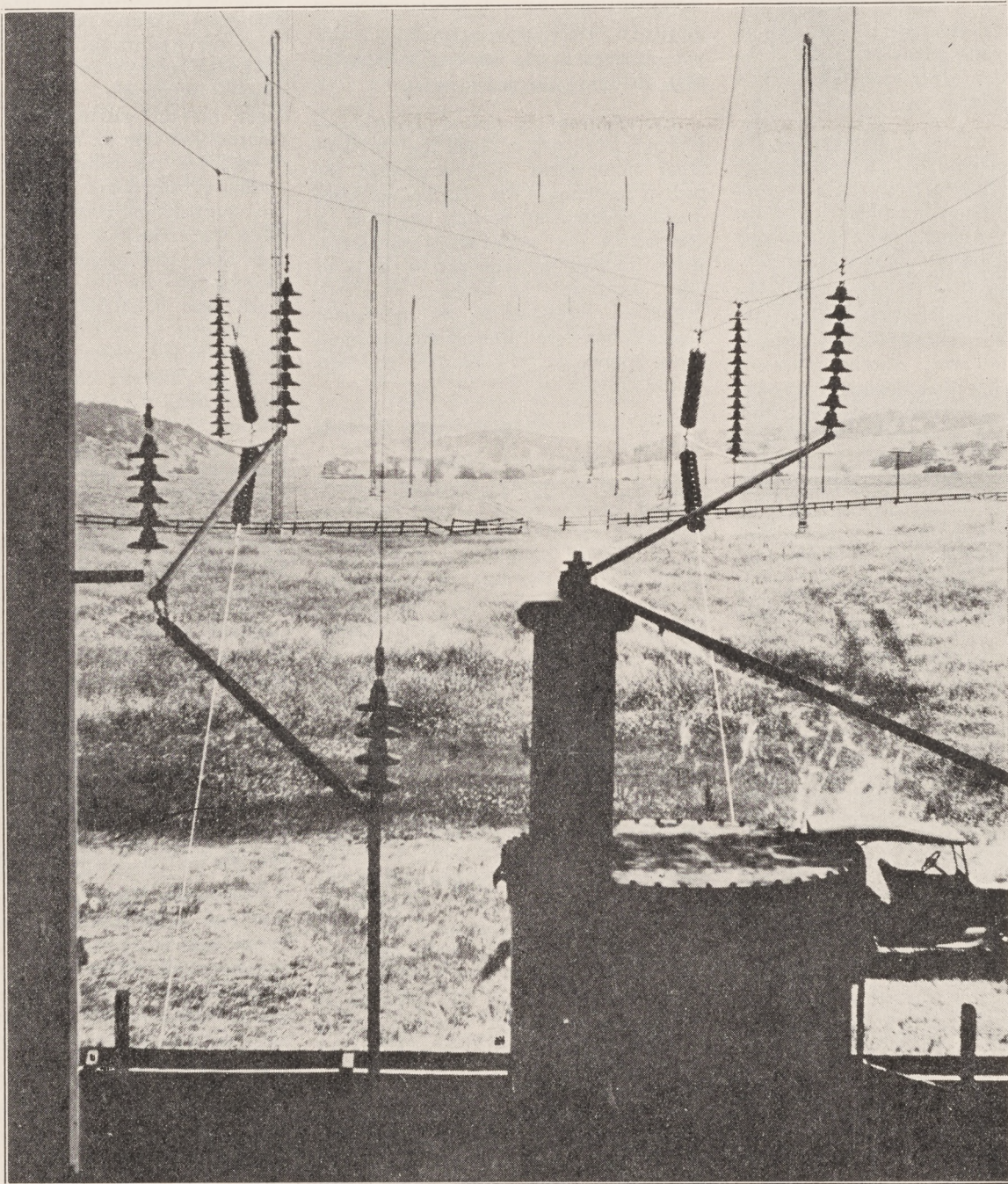


OF SOUTHERN CALIFORNIA

Vol. 1

MAY 20, 1934

No. 9



**SOURCE OF HIGH VOLTAGE INFORMATION**

Rolling foothills of the Stanford campus viewed through the great door of the two-million volt Harris J. Ryan laboratory, from which the District has obtained data for the design of the Aqueduct transmission line from Boulder Dam. (See page 3.)



• COLORADO RIVER •  
**AQUEDUCT NEWS**  
THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

LOS ANGELES, CALIFORNIA

*Published twice monthly in the interest of Field and Office Workers on the Colorado River Aqueduct, and for the information of all other citizens of the Metropolitan Water District.*

Vol. 1 May 20, 1934 No. 9

### A MIGHTY CHAIN

It is with a great deal of pride that the NEWS calls attention to the Colorado River Aqueduct map on Pages 4 and 5 of this issue.

The work of V. J. Meyers, of the Distribution Division, this two-page layout tells the whole engrossing story of the Metropolitan Water District's great water supply system, more graphically than it could be told in words.

It is fitting that the map should be reproduced in the NEWS at this time. A glance at the tunnel progress table on Page 6 will tell why. Another milestone in Colorado River Aqueduct history has been passed—the excavation of the first one-quarter of the project's 91 miles of tunnels.

But Pages 4 and 5 are more than commemorative of accomplishment in tunnel driving. On a construction project as far-flung and varied as the Colorado River Aqueduct, it is difficult for an interested observer, no matter how closely connected, to keep the general panoramic picture in mind. Each component part of the aqueduct looms so large that all of us have a tendency to allow the proverbial trees to obscure the forest.

Wrapped up in our own problems and accomplishments, we forget sometimes that thousands of others have problems and accomplishments just as important to the project as our own.

Study of this new aqueduct map should serve to destroy any "splendid isolation" which we may be enjoying. Graphically it shows what the other fellow is doing, and where he is doing it. It is a vivid picturization of the old saw that no chain is any stronger than its weakest link.

And there can be no doubt as to the aptness of that figure of speech. Each tunnel, each stretch of highway, each length of water pipe, and each mile of power line, is a link in a mighty chain, forged to protect Southern California from drought.

## GENERAL MANAGER REVIEWS ACTIVITIES OF MONTH ON AQUEDUCT

(EDITOR'S NOTE: The following is a brief summary of the monthly report of General Manager and Chief Engineer Weymouth, filed with the Board of Directors in May, covering work during April. These summaries are presented at regular intervals.)

**Legal Division**—Delivery of Interim Certificate No. 11 was made to the Reconstruction Finance Corporation on April 16, 1934, and payment therefor was received in the amount of \$2,037,000, including accrued interest.

**Miscellaneous Activities Division**—During the month of April the District's labor employment office completed the task of checking in the field the residence qualifications of all persons employed by contractors on aqueduct construction work. During the same period the labor office continued the issuance of Certificates of Registration, or permanent identification cards, to employment applicants known to be bona fide residents of the District.

**Construction Division**—(See table on Page 6.)

**Field Engineering Division**—Field surveys for the Black Canyon transmission line from Boulder Dam to Hayfield are practically completed. In the Coachella Division the number of accidents on tunnel operations was reduced by eleven, and the corresponding lost-time accident frequency was lowered 72 points. During the month of April a total of 3,830,400 k.w. hours of power was used, 13,000 telephone calls were handled, and 1,951,909 cubic feet of water was delivered.

**Office Engineering, Civil**—Individual designs have been prepared for the concrete structures on Division 1 of the aqueduct between Whipple Mountain and Iron Mountain, and work has been started on the structures of Division 2. An inspection was made of the construction water supply system to determine what additional water treatment measures may be necessary. The compilation for the Reconstruction Finance Corporation of maps and descriptive data for all rights of way acquired along the aqueduct was begun, and routine and special reports and other material were prepared and transmitted to that organization as required.

**Electrical Engineering Division**—Work was continued on the structural

design of the permanent transmission lines. Studies were continued on the design of permanent pumping plants, the particular points under consideration being the type of building, the inlet and discharge connections, and the arrangement of equipment. Arrangements were made for the extension of the 33 kv transmission line to Valverde Shaft No. 4, and for the construction of a substation at this point. The peak load of the construction power system reached 6624 kw, which is about 35 per cent less than the original estimate. The amount of energy purchased during April was 3,820,000 kwhr, or about 9 per cent more than estimated. On account of the favorable character of the load, the District continues to receive the benefit of the maximum power factor discount, 10 per cent, and the unit price paid the power companies was 6.3 mills per kwhr, which may be compared with the original estimate of 7.5 mills per kwhr. Present use is about 16 kwhr per cubic yard of tunnel excavation, compared with an estimated use of 35 kwhr per cubic yard.

**Right of Way Division**—Regular work was continued on the securing of aqueduct rights of way.

**Personnel Division**—Thirty-four per cent of those called in for consideration on openings rejected the positions. The March labor turnover for all District forces was 6.53 per cent, the turnover for classified positions being 1.34 and for unclassified positions 8.86.

**Purchasing Division**—During April a total of 1194 purchase orders were issued covering purchases amounting to approximately \$146,153; seventy-seven subpurchase orders were issued amounting to approximately \$2,151; the combined total purchases for the District for the month amounted to \$148,304.

**Accounting and Costkeeping Division**—Actual costs to April 30, 1934, amounted to \$18,272,622.44, covering portions of works and activities, the total cost of which is estimated at \$61,647,772.



# MILLION VOLT LABORATORIES CONTRIBUTE INFORMATION FOR POWER LINE DESIGN

Nearly 400,000 horsepower of electrical energy must ultimately be transmitted from Boulder Dam across the desert to the pumping plants which will lift the water from the Colorado River over the mountains to the cities of the Metropolitan Water District. The 230,000 volt line, which will be built to carry this energy, will be subject at some seasons of the year to onslaughts by lightning. A lightning stroke produces a very high voltage on the line and may start an arc across one of the insulator strings, thus short-circuiting the line.

## Artificial Lightning

In order to study the effect of such occurrences at close range, artificial lightning has been produced in the million volt laboratory of the California Institute of Technology. Insulator strings of types proposed for use on the District's lines have been subjected to this artificial lightning and observations made on their ability to withstand damage. The spectacular effect which results when the artificial lightning causes an arc or "flashover" is shown in the illustration at the upper right.

The experiments at Caltech have been of much value in determining insulator characteristics. They have been conducted under the direction of Professor Royal W. Sorenson, head of the electrical engineering department and consulting engineer for the District.

## Corona Studies

Another condition which may occur on the District's line is the formation of "corona." This consists in the partial breakdown of the air surrounding a transmission line wire or cable when the latter is operated at too high a voltage in proportion to its diameter. This is especially likely to occur at the elevations at which the District line will be located. There results a leakage of electricity into the atmosphere, which is visible at night as a luminous violet discharge forming brushes or tufts along the conductor. In the picture at the lower right, a wire bent in the form of a letter "S" is being operated at a voltage sufficiently high to produce copious corona. The scale of the illustration may be appreciated by noting the step-ladder at the bottom of the picture.

The corona picture just referred to was taken (as might be guessed from the letter "S") at Stanford University,

which has a two-million volt laboratory founded by Harris J. Ryan, a world-famous pioneer in the study of corona. In order to gather information on which might be based a prediction of the corona conditions to be expected on the District line, District engineers have been working with Professor Joseph S. Carroll, present head of the Stanford laboratory and co-author of several authoritative papers on corona.

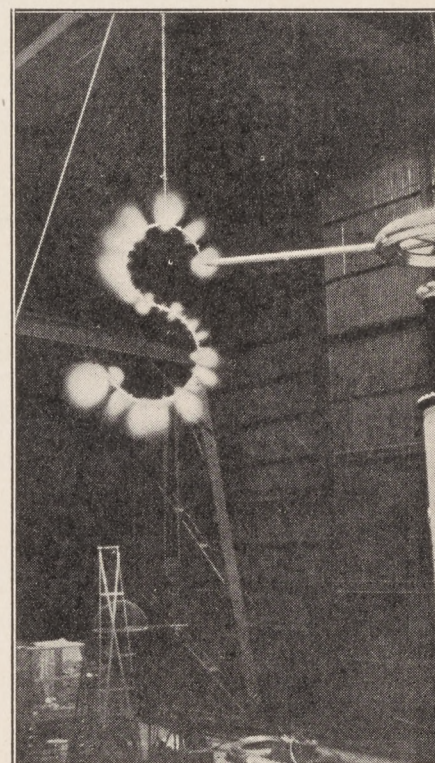
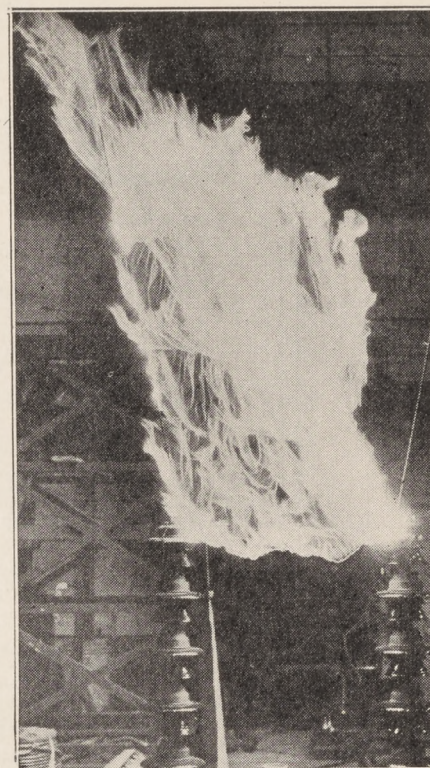
Studies made by the laboratory staff over a period of several years, as well as some recent experiments, were analyzed to give the best possible prediction of the amount of corona to be expected on the District lines. Of especial interest were some studies made in a vacuum tank in which the air could be rarefied to represent the conditions existing at high altitude. In another set of studies the result of dragging the wire over rough, rocky ground during erection of the line was determined.

## Hollow Conductor

The information gained from these Stanford tests has been used in selecting the diameter which the conductor should have in order to avoid any appreciable amount of energy loss due to corona formation. It is interesting to note that if the conductor were made of solid copper in the diameter required at the high altitudes traversed by the District line, it would have much more area than is needed to carry the current which will flow in the line; and thus would represent an economic waste. Hence consideration is being given to some very recently evolved designs in which the conductor is made hollow like a pipe, thus obtaining a large diameter without much solid area.

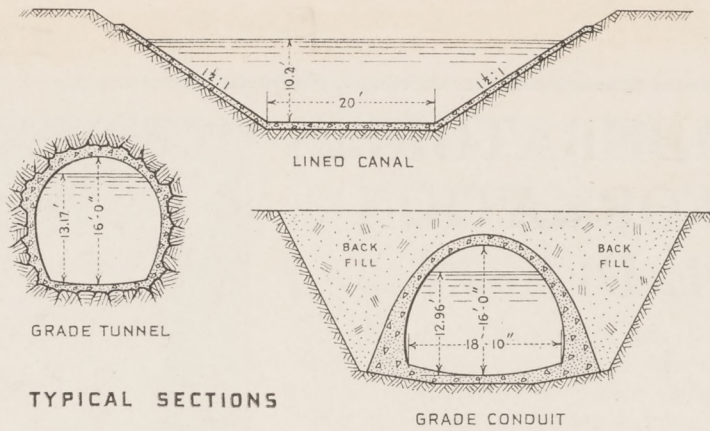
## Practical Check

In order to obtain a practical check on corona formation, careful examination has been made of two Southern California lines which operate at 230,000 volts. One line was inspected where it crosses Mount Gleason at 5,600 feet; the other where it traverses the Ridge Route at 4,600 feet. The examination was made in the dead of night so that the minutest amount of corona might be visible. The observations showed that predictions based on the Stanford data may safely be relied upon.



Spectacular display of high-voltage phenomena in laboratories where District studies are being made. (Above) Artificial lightning discharge in the 1,000,000-volt laboratory at California Institute of Technology. (Below) Corona formation in a "Block S" at Stanford high voltage laboratory. From these studies will be gained information valuable in the design of the District's 230,000-volt power lines.





Points of construction interest along the Colorado River completed, gives latest information on the location of the under construction, division and field headquarters, the San Jacinto Aqueduct, and the Aqueduct power transmission line.







**BEST PROGRESS****This Period**

Rock Tunnels-Yellow Canyon West, 772 ft.  
Gravel Tunnels-Whitewater No. 2, 753 ft.

**TUNNEL PROGRESS**

APRIL 16 - MAY 15, 1934

Tunnel Excavated to Date, 24.24 Miles

**BEST WEEK'S RECORD****This Year**

Rock Tunnels-Cottonwood East, 227 ft.  
Gravel Tunnels-Whitewater No. 2, 201 ft.

| TUNNELS<br>ON<br>CONTRACT  | Length<br>in feet         | Number<br>of<br>Shifts | EXCAVATION PROGRESS<br>IN FEET |                |                  |
|--|---------------------------|------------------------|--------------------------------|----------------|------------------|
|  |                           |                        | Average<br>Per<br>Shift        | This<br>Period | Total<br>to date |
| Walsh Constr. Co.<br>COLORADO RIVER<br>West Portal                           | (5515)<br>5515            |                        |                                |                | 0                |
| COPPER BASIN, No. 1<br>West Portal   | (689)<br>689              | 51                     | 6.7                            | 340            | 340              |
| COPPER BASIN, No. 2<br>East from adit  | (11,580)<br>1878          |                        |                                | 0              | 1878             |
| Adit   | 330                       |                        |                                | 0              | 330              |
| West from adit   | 9702                      | 90                     | 7.5                            | 675            | 3173             |
| WHIPPLE MT.<br>East from adit  | (32,265)<br>18,352        | 90                     | 7.5                            | 675            | 3152             |
| Adit   | 924                       |                        |                                | 0              | 924              |
| West from adit   | 13,913                    | 88                     | 6.0                            | 532            | 2694             |
| Winston Bros.<br>IRON MT.<br>East from shaft                                 | (39,759)<br>9844          | 78                     | 4.3                            | 336            | 1209             |
| Shaft  | 165                       |                        |                                | 0              | 165              |
| West from shaft  | 13,743                    | 78                     | 8.0                            | 623            | 3390             |
| Utah Constr. Co.<br>IRON MT.<br>West Portal                                  | 16,172                    | 90                     | 7.7                            | 690            | 6123             |
| Winston Bros.<br>COXCOMB<br>East Portal                                      | (17,795)<br>8765          | 78                     | 7.5                            | 589            | 4380             |
| West Portal  | 9030                      |                        |                                | 0              | 0                |
| Broderick & Gordon<br>EAST EAGLE MT.<br>West Portal                          | (9,442)<br>9442           |                        |                                | 0              | 0                |
| WEST EAGLE MT.<br>East from adit   | (26,494)<br>7871          | 80                     | 5.1                            | 411            | 1102             |
| Adit   | 2008                      |                        |                                | 0              | 2008             |
| West from adit   | 7974                      | 81                     | 2.3                            | 184            | 879              |
| Dixon & Bent<br>WEST EAGLE MT.<br>West Portal                                | 10,649                    | 78                     | 9.2                            | 714            | 4163             |
| Hunkin & Conkey<br>HAYFIELD, No. 1<br>East from adit                         | (9677)<br>5317            | 41                     | 6.1                            | 251            | 1209             |
| Adit   | 511                       |                        |                                | 0              | 511              |
| West from adit   | 4360                      | 50                     | 7.1                            | 357            | 841              |
| Shofner & Gordon<br>HAYFIELD, No. 2<br>West Portal                           | (5375)<br>5375            | 42                     | 6.0                            | 254            | 2062             |
| J. F. Shea Co.<br>COTTONWOOD<br>East Portal                                  | (20,105)<br>10,114        | 78                     | 8.7                            | 681            | 5162             |
| West Portal  | 9991                      | 78                     | 7.9                            | 617            | 4875             |
| Morrison-Knudsen<br>MECCA PASS<br>No. 1, West Portal                         | (5,940)<br>338            | 55                     | 4.5                            | 245            | 280              |
| No. 2, West Portal   | 997                       | 0                      | 0                              | 0              | 7                |
| No. 3, East Portal   | 4605                      | 77                     | 9.9                            | 760            | 3636             |
| West Constr. Co.<br>WHITEWATER<br>No. 1, West Portal                         | (10,206)<br>2060          | 0                      | 0                              | 0              | 35               |
| No. 2, East Portal   | 8146                      | 78                     | 9.7                            | 753            | 5170             |
| Wenzel & Henoch<br>SAN JACINTO<br>East from Cabazon                          | (67,415)<br>8553          | 90                     | 2.7                            | 239            | 511              |
| Cabazon shaft  | 246                       |                        |                                | 0              | 246              |
| Cross drift  | 935                       |                        |                                | 0              | 935              |
| West from Cabazon  | 22,839                    | 90                     | 5.5                            | 497            | 1253             |
| East from Potrero  | 20,589                    | 16                     | 1.1                            | 17             | 17               |
| Potrero shaft  | 796                       | 59                     | —                              | —              | 796              |
| West from Potrero  | 6712                      | 15                     | 1.0                            | 15             | 15               |
| West Portal  | 8722                      | 90                     | 2.3                            | 208            | 1391             |
| Hamilton & Gleason<br>BERNASCONI<br>East Portal                              | (6220)<br>6220            | 56                     | 6.0                            | 336            | 3186             |
| Dravo Contr. Co.<br>VALVERDE<br>East from Shaft 1                            | (38,077)<br>(1452)        | 81                     | 5.8                            | 472            | 1452             |
| Shaft 1  | 64                        |                        |                                | 0              | 64               |
| West from Shaft 1  | 1525                      | 84                     | 1.4                            | 121            | 790              |
| East from Shaft 2  | 5400                      | 84                     | 4.4                            | 368            | 3154             |
| Shaft 2  | 204                       |                        |                                | 0              | 204              |
| West from Shaft 2  | 5400                      | 84                     | 4.9                            | 411            | 3120             |
| East from Shaft 3  | 6950                      | 84                     | 2.2                            | 183            | 2450             |
| Shaft 3  | 192                       |                        |                                | 0              | 192              |
| West from Shaft 3  | 6950                      | 84                     | 4.0                            | 334            | 2763             |
| East from Shaft 4  | 5000                      |                        |                                |                |                  |
| Shaft 4  | —                         |                        |                                |                |                  |
| West from Shaft 4  | 5400                      |                        |                                |                | 0                |
| Total Excav. Contract Tunnels<br>exclusive of Adits and Shafts<br>(In Miles) | 306,554<br>58.06          | 2,239                  | 5.76                           | 12,888<br>2.44 | 75,862<br>14.37  |
| TUNNELS ON FORCE ACCOUNT   |                           |                        |                                |                |                  |
| EAST COACHELLA<br>TUNNEL<br>Yellow Canyon Adit                               | Sched.<br>(96,610)<br>686 |                        |                                | 0              | 686              |
| East from adit   | 1                         | 78                     | 7.8                            | 605            | 5022             |
| West from adit   | 1                         | 78                     | 9.9                            | 772            | 4629             |
| Fargo Canyon Adit  | 891                       |                        |                                | 0              | 891              |
| East from adit   | 2                         | 78                     | 8.0                            | 626            | 4214             |
| West from adit   | 2                         | 78                     | 5.7                            | 441            | 4034             |
| Berdoo Canyon Adit   | 2042                      |                        |                                | 0              | 2042             |
| East from adit   | 3                         | 78                     | 9.8                            | 762            | 5061             |
| West from adit   | 3                         | 78                     | 7.8                            | 606            | 4745             |
| Pushawalla Canyon Adit   | 2935                      |                        |                                | 0              | 2935             |
| East from adit   | 4                         | 78                     | 7.4                            | 578            | 2651             |
| West from adit   | 4                         | 78                     | 8.8                            | 686            | 2894             |
| WEST COACHELLA TUNNELS   | (80,092)                  |                        |                                |                |                  |
| THOUSAND PALMS<br>No. 1, West Portal   | 5                         | 78                     | 6.7                            | 519            | 4747             |
| No. 2, Tunnel  | 5                         |                        |                                | 0              | 3838             |
| WIDE CANYON<br>No. 1, E. Portal  | Sched.<br>5               | 78                     | 6.3                            | 490            | 894              |
| No. 1, W. Portal   | 6                         | 78                     | 7.4                            | 574            | 4325             |
| No. 2 Tunnel   | 6                         |                        |                                | 0              | 848              |
| SEVEN PALMS<br>E. Portal   | (16,730)<br>6             | 78                     | 3.9                            | 307            | 3658             |
| W. Portal  | 7                         | 53                     | 3.3                            | 176            | 176              |
| LONG CANYON<br>E. Portal   | (15,240)<br>7             | 54                     | 3.9                            | 213            | 223              |
| W. Portal  | 8                         |                        |                                | 0              | 0                |
| BLIND CANYON<br>E. Portal  | (6,788)<br>8              |                        |                                | 0              | 0                |
| W. Portal  | 8                         | 50                     | 2.8                            | 138            | 138              |
| MORONGO No. 1<br>E. Portal   | (5,512)<br>8              | 20                     | 1.4                            | 28             | 28               |
| W. Portal  | 8                         |                        |                                | 0              | 0                |
| MORONGO No. 2<br>E. Portal   | (1790)<br>8               |                        |                                | 0              | 0                |
| W. Portal  | 8                         |                        |                                | 0              | 0                |
| Total excav. Force Acct. Tunnels<br>excl. of Adits and Shafts<br>(In Miles)  | 176,704<br>33.47          | 1,113                  | 6.76                           | 7,521<br>1.42  | 52,125<br>9.87   |
| Total Tunnel Excavation (Miles)  | 91.53                     |                        | 6.09 ft.                       | 3.86           | 24.24            |

Heading excavation is counted as two-thirds of full tunnel excavation.



# NEWS FROM FIELD AND OFFICE

More than 500 citizens of the thirteen Metropolitan Water District cities were in attendance on Tuesday, May 15, at the Los Angeles Advertising Club's Metropolitan Water District luncheon. Speakers included Chairman W. P. Whitsett, General Manager Weymouth, and Director John R. Richards. A special feature of the affair, which was held at the Biltmore Hotel, was the showing of two talking motion pictures which graphically revealed Southern California's need for water, and construction activity on the Colorado River Aqueduct.

Because only 82 out of a possible 700 or more evidenced enough interest in the proposed group insurance for underground workers to send in an application card, this plan cannot be worked out. Consequently those who signed up for this insurance will not be able to get it. The insurance company required that from 50 to 75 per cent of the entire group be signed up before they would accept the risk.

Ferrell Boyd, timekeeper at the Banning office, is still headed for China via the short route. He is establishing a record of which the men who bore tunnel shafts might well be proud. The "water" well on his country place near Beaumont, on which he has been assiduously digging for the past two months, has not yet produced anything but a young mountain of dirt.

Valverde Camp's dormitories, consisting of five 24-man houses, were destroyed by fire on May 9. The camp bath house also was consumed. Preparations are being made by the Threlkeld Company to replace part of the plant.

Howard F. Christenson, who has been with the engineering force on Division No. 4 since October, 1933, has returned to his old position with the Pacific Electric Railway and is now a city dweller again.

R. W. "Bob" Varney, well known to the "old-timers" of the field engineering division where he has been employed for the past four years, recently resigned his position and is now with the construction forces at Yellow Canyon Camp.

"Cooling System" Collins turned on his ventilators at Long Canyon Camp on May 14. The made-to-order weather is highly appreciated.

**Flying during May for the best camp records for safety, progress, and economy on the Coachella Division in April were:**

**Safety Flag—1000 Palms.  
Economy Flag — Yellow Canyon.**

**Progress Flag — Yellow Canyon.**

\* \* \*

**The Hard Hat emblem of efficiency on Division 3 was awarded by Division Engineer Stearns to Winston Brothers' East Iron Mountain Camp, after reposing during February and March at the Coxcomb Camp of the same company.**

A new star is hurtling across the "athletic" firmament. Pat McCarthy, of Long Canyon Camp, has challenged all comers to a game of golf pool.



There are certain points of similarity between Dean Luther, Dravo Contracting Company's superintendent at Valverde Shaft No. 1, and the proverbial ground hog who emerges from his hole, only to beat a retreat if he sees his shadow. Mr. Luther follows the same procedure if he sees a photographer lurking about the diggings. On one occasion, however, it didn't work—the NEWS' demon cameraman, Will Fox, followed him right back into his hole, as the above photographic gem will prove.

Ailene Carmichael, secretary to Safety Engineer Osgood, recently had an opportunity to practice some of the safety measures expounded in her office. It happened one evening while she was riding with a masculine friend in the hills back of Beaumont. They suddenly were confronted with a male of the species bovine, guarding a gate at the bottom of a steep grade. The gentleman cow proved to be no gentleman at all. He lowered his head, pranced, and snorted. After some fifteen minutes spent rendering first aid to her agitated companion, Ailene found time to toss the bellowing bovine an apple. She then got out of the car and opened the gate. Thousand Palms Camp, it is understood, is contemplating relinquishing its Safety Flag to Miss Carmichael.

The first series of three baseball games played between East Iron Mountain and East Coxcomb camps for a purse of \$25, donated by Winston Bros., was won by Iron Mountain Camp. The purse was given to Doctor Behrend, who was injured during the game. The second series between the rival teams has started, and at present stands one all.

Contractors on the new State highway section between Indio and Shaver's Summit were at Berdoo on May 5 to confer with Division Engineer Diemer as to locations of water taps and the amount of whater which would be available for them in their construction work, as provided in the contract between the State and the District.

Acting on the recommendation of General Manager Weymouth, the board of directors, on May 11, authorized the issuance of an advertisement for bids on \$8,064,000 in Colorado River Aqueduct bonds. Bids are to be received and opened on June 8.

The new commissary at Long Canyon Camp opened Monday, May 7, with a rush of business. The soft drink department was a welcome oasis for the thirsty workers. Art Miller, former traveling timekeeper, is in charge.

## AQUEDUCT TEMPERATURES

May 1 to 12, Inclusive

|                  | Max. | Min. |
|------------------|------|------|
| Div. 1 .....     | 111° | 54°  |
| Div. 2 & 3 ..... | 110° | 58°  |
| Div. 4 .....     | 107° | 57°  |
| Div. 5 & 6 ..... | 107° | 43°  |



## DIRECTORY

### BOARD OF DIRECTORS

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Franklin Thomas, Vice-Chairman  
S. H. Finley, Secretary

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Beverly Hills.....George R. Barker  
Burbank.....J. L. Norwood  
Compton.....William H. Foster  
Fullerton.....Walter Humphreys  
Glendale.....Frank P. Taggart  
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Charles H. Toll, Treasurer  
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Asst. Chief Engineer.....Julian Hinds  
General Counsel.....James H. Howard  
Asst. Controller.....J. M. Luney  
General Superintendent.....James Munn  
Chief Elec. Engineer.....J. M. Gaylord  
Construction Engineer.....J. B. Bond  
Asst. to Gen. Mgr.....Don J. Kinsey

### DIVISION ENGINEERS

Division 1.....R. C. Booth  
Divisions 2 and 3.....John Stearns  
Division 4.....R. B. Diemer  
Divisions 5 and 6.....B. C. Leadbetter

### SUPERINTENDENTS

Colorado River, Copper Basin and Whipple Mt. Tunnels, Walsh Construction Co., F. T. Huntington, Gen. Supt.; W. A. Huntington and E. A. Hatch, Tunnel Supts.  
Coxcomb Tunnel and Iron Mt. shaft, Winston Bros., E. A. Bernard, Gen. Supt.; F. T. Hillman and R. B. Johnson, Tunnel Supts.  
Iron Mt. Tunnel, West Portal, Utah Constr. Co., Ben App, Gen. Supt.  
East Eagle Mt. Tunnel and West Eagle Mt. Tunnel, east portion, Broderick & Gordon, F. E. Stokes, Gen. Supt.  
West Eagle Mt. Tunnel, west portion, L. E. Dixon and Bent Bros., P. C. Guinn, Gen. Supt.  
Hayfield Tunnel No. 1, Hunkin & Conkey Constr. Co., G. B. Hoag, Gen. Supt.; F. Backlund, Tunnel Supt.  
Hayfield Tunnel No. 2, Shofner & Gordon, H. E. Warden, Gen. Supt.  
Cottonwood Tunnel, J. F. Shea Co., Inc., Gilbert Shea, Gen. Mgr.; Joe Bonner and Carl Nelson, Tunnel Supts.  
Mecca Pass Tunnels, Morrison-Knudsen, S. A. Dahlberg, Gen. Supt.; C. A. Griffen, Asst. Supt.  
Coachella Division, R. M. Merriman, Division Supt.  
Yellow Canyon Adit, E. Coachella Tunnel—District Force Account.....W. L. Taylor  
Fargo Adit, East Coachella Tunnel—District Force Account.....J. H. Manwaring  
Berdoe Adit, East Coachella Tunnel—District Force Account.....F. A. Weller  
Pushawalla Adit, East Coachella Tunnel—District Force Account.....C. J. Kavanagh  
Thousand Palms—District Force Account.....D. L. Reaburn  
Wide Canyon—District Force Account.....John Jackman  
Little Morongo—District Force Account.....R. L. Bryant  
Whitewater Tunnels, West Constr. Co., H. E. Carleton, Gen. Supt.; Angus MacDonnell, Tunnel Supt.  
San Jacinto Tunnel, Wenzel & Henech, Walter Hoencke, Gen. Supt.; W. A. Boyd, Walter Baer, and Jack May, Tunnel Supts.  
Bernasconi Tunnel, Hamilton & Gleason Co., H. J. King, Gen. Supt.  
Valverde Tunnel, Dravo Contr. Co., H. C. Richardson, Gen. Supt.; Dean Luther, J. R. Glaeser, and Fred Youmans, Tunnel Supts



J. F. Shea Company's Cottonwood Camp.

## 137 Theatres Show Aqueduct News Reel

Showing of the talking motion picture, the Colorado River Aqueduct News, to a potential audience of almost 1,000,000 citizens was announced this week by the Miscellaneous Activities Division following a check-up of requests for bookings received by the District from Southern California theaters.

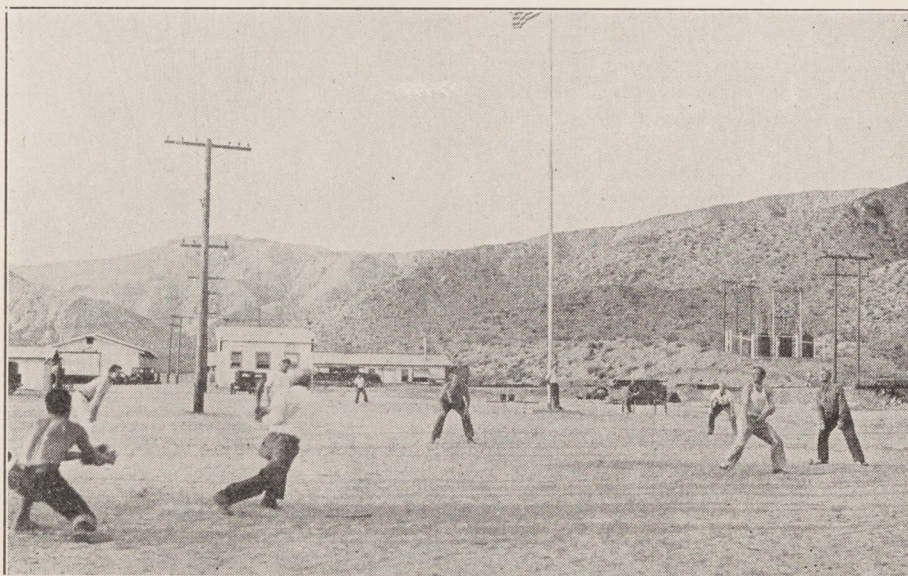
The four-minute news reel, showing scenes of construction work on the aqueduct, was released to 133 theaters in the thirteen cities of the District, and to four theaters in cities outside the District, between March 1 and May 11.

The number of persons viewing the film, based upon a showing to a fifty per cent capacity house, totaled 950,000.

## Cottonwood Job at One-Half Mark

The one-half mark in excavation of the Cottonwood tunnel will be a matter of history by the time this issue of the NEWS reaches its readers, it was indicated by construction progress figures received last week from the field.

Compilations for the week ending May 12 revealed that J. F. Shea Company's crews working at the tunnel's east heading had completed 5,120 feet of bore, while 4,809 feet had been excavated at the west heading. The tunnel's total length is 20,105 feet. Gilbert Shea is general manager of the job; Joe Bonner and Carl Nelson are tunnel superintendents.



Spring training in the big leagues—the Wide Canyon Cactus Hoppers